

Many a slip between cup and lip: process evaluation of a program to promote and support evidence based public health practice

Abstract

The main aims of this study were to document whether an intervention for promoting evidence-based public health practice had been delivered as intended and to explore the reasons for its lack of impact. Process data from the implementation of the program and data from interviews with 40 public health physicians were analyzed. Though they expressed satisfaction with the service, the doctors experienced the program as rather irrelevant for their daily work. They did not perceive that they dealt with many issues relevant for the use of research information, and if they did, referring to research would not make any difference to the way others perceived their advice. There is a need to develop more overlying strategies for integrating evidence into decision-making than addressing the individual level.

Introduction

There are discrepancies between the extent to which health care professionals use research information in practice (Gowman et al. 2000; McColl et al. 1998; Prescott et al. 1997; Leckie et al. 1996; Bohannon and LeVeau 1986; Morrow-Bradley and Elliott 1986) and the level of use that could justifiably be called “evidence-based practice” (Muir Gray 1997). Our previous studies of Norwegian public health physicians indicate that, also in this profession, there are many issues that could potentially be illuminated by research evidence but that little explicit use is made of evidence in decision-making processes (Forsetlund and Bjørndal 2001; Forsetlund and Bjørndal 1999).

Public health physicians in Norway are employed at the municipal level as well as the national level. Their task is to give advice to the authorities on public health matters. Examples may be the handling of communicable disease; planning of health services or advising on which preventive measures to implement in the community.

We recently undertook a 20-month randomised-controlled trial of a program intended to bridge this gap between existing practice and evidence-based practice among public health doctors in Norway (Forsetlund et al. 2002, Submitted). By basing the intervention program on an explicit theory we wanted to prevent a total “black-box”-approach, a familiar criticism of experimental trials in social research (Lipsey 1993). Such an approach has been widely recommended, though adopted by few (Weiss 1997). As evidence-based public health practice may be perceived as an innovation to the physicians, the theory of innovation diffusion was adopted as the main theory to develop the intervention and to analyze the results (Rogers 1995). Describing explicitly the process through which the intervention was expected to have effect, made it possible to see at what point the breakdown of the expected sequence of the program occurred (Weiss 1997), but not *why* increased knowledge did not translate into changed behaviour.

If the results of the trial were caused by insufficient or faulty implementation of the program, it would be wrong to draw conclusions on the relevance of the program itself (Yeaton 1981). This type of error has been called a Type III error (Steckler 1989). In this study we used process and qualitative information to gain a better understanding of why the program failed. Thus, this study had two aims. The first aim was to document the degree to which the planned intervention was actually delivered as intended. The second aim was to explore how the physicians experienced the intervention program by analysing interview data within the framework of innovation diffusion theory, in order to understand why things did not happen according to program theory.

Summary of the experiment

The target population of the experiment was public health physicians. They were recruited by an invitation to all physicians working in municipalities of a certain size, i.e. more than 3000

inhabitants. Recruitment was stopped when 73 had been allocated to the intervention group and 75 to the control group, fulfilling the number of the sample size calculations. To make it easier to recruit, we offered everybody the possibility of free library services for the duration of the project. When the intervention started the control group received a letter reminding them about this service. The intervention program was aimed at influencing the whole process of evidence-based practice: identifying and formulating questions, searching for research information, appraising it critically and applying relevant evidence explicitly in practice.

The primary outcome measure was behaviour. This was measured by analysing different documents produced by the physicians, but also by self-reports, e.g. number of times they said they had logged on to the databases. Intermediate outcomes were knowledge, attitudes to the use of research, feeling of self-efficacy and decision-to-adopt as measured by scale instruments in a questionnaire.

Despite our targeting of specific barriers and using a multifaceted intervention (Forsetlund and Bjørndal 2002), the effect of the program was confined to an increase in knowledge for the group who received the program compared to the non-intervention group. Except for knowledge, no differences were shown in intermediate or primary outcomes (table 1a, 1b and 2).

Program theory and components

Rogers defines diffusion as the “process by which an innovation is communicated through certain channels over time among the members of a social system.” (Rogers 1995, p.5). In the first stage of the innovation-diffusion process the individual gains knowledge of the innovation and forms an opinion about it during the persuasion stage. These positive or negative attitudes will be of importance when deciding to adopt or reject the innovation in the decisional stage. The individual’s feeling of self-efficacy also influences the process. If the

intervention is adopted, implementation and confirmation follow as the two last stages in the diffusion process. How the potential adopters perceive the characteristics of the innovation regarding relative advantage, compatibility, complexity, trialability and observability as well as their own degree of innovativeness are important. Some prior conditions have to exist for behaviour to change, such as the extent of felt needs and the strength of the existing norms of the social system within and outside the group. The nature of the communication channels used to diffuse the innovation, how many persons the innovation-decision depends on and the intensity of the change agent's efforts may also speed up or slow down the change process.

The intervention program was intended to lead the participants from the first knowledge stage to the confirmation stage when adoption was to occur. To further influence and strengthen the adoption process, goal setting was to be used as a motivational technique (Locke 1990). This involved participants signing a contract about what they would change in their practice. The conceptual model is illustrated in figure 1.

An interactive small-group workshop in evidence-based health care was aimed to introduce the physicians to the knowledge stage. To support the adoption of the innovation in the decision stage, we negotiated access to databases for training and practical use. Free use of our library services and access to an information service were also planned. Simplified access to research information combined with supportive information channels, such as newsletters and discussion list, were intended to encourage the adoption of the innovation. Another aim of the newsletter and discussion list was to act as general reminders of evidence-based practice and of the support services we offered during the trial.

Even if five main steps are conceptualised in the innovation-decision process the process is dependent on a complex set of factors and is not to be perceived as a strictly linear process.

Methods

Quantitative process-data

Personnel. A professor in public health (AB) and an information scientist (LF) did most of the workshop teaching. A public health physician (PB) and a research librarian (LN) were in charge of the information services. All had prior teaching experience and were trained in evidence-based medicine.

Workshop. Lists were kept of who participated in workshops of different length. Each workshop session was ended by a discussion with participants on the workshop format, content and relevance.

Discussion list. An e-mail discussion list was set up. Participants were invited partly through the workshops and partly by letters. The aims of the list were; information-sharing, opinion-forming and peer discussions. The list was facilitated by the project team. All messages sent to the list were archived for later analysis.

Information service. One of the goals of the project was to establish an information service for, and in close interaction with, the public health physicians. The content and structure for a web site was built up as the project progressed. The answers to the questions from the physicians were put into a report database, and an archive of educational material for critical appraisal was developed and made accessible. The website also included links to other relevant resources for use in evidence-based practice (such as the databases described below) and to traditional library services.

The web site and discussion list were considered the most important interfaces between the project participants and the information service. Questions could be submitted by

the method most convenient to the participants, eg, by telephone, fax, letter or e-mail to the project team or to the discussion list. The procedure followed on the reception of a question is illustrated in Appendix 1 and the sources searched for creating responses to the questions are shown in Appendix 2. Each question was categorised in accordance with pre-defined subject areas. For each subject area a set of selected resources was searched. The project team critically appraised the literature and, where possible, a report based on the retrieved evidence was written. If we could not make a report, for example because of a lack of relevant literature, we sent the literature references to the question's originator to show what we had found and explained why we were unable to produce a report. The format of the reports is outlined in Appendix 3. Whenever a report was written, it was distributed on the project web pages and announced on the e-mail discussion list. Reports were also sent by mail to participants without Internet access.

Databases. The databases offered to everyone in the intervention group were the Cochrane Library, Medline integrated with Best Evidence, Embase/Psychiatry and Sociofile. The number of logons to the Cochrane Library and Ovid databases were recorded by the hosts. Logs of the Ovid search sessions from May 1999 until February 2000 were obtained and analysed while the project lasted.

Qualitative data

Study design. The intervention ended in January 2001. The qualitative study was carried out between July and October 2001. The choice of telephone interviews as the preferred method for data collection was not only influenced by resource considerations, but also by the assumption that it is easier to convey any potential critique by telephone than face to face. A semistructured interview guide drawing upon the variables that Rogers' model of innovation

diffusion indicates as crucial was designed (Appendix 4). Other central questions were: To what extent physicians had grasped the aim of the program and how successful each program component had been. A medical student was chosen to do the interviewing. We assumed that an 'outsider' would be perceived as more objective and would encourage the physicians to give full data in order to help the interviewer understand, as well as encourage frank comments.

Before the interviews the public health physicians were sent a letter inviting them to participate in the interviews to help us evaluate the project. They were also informed at this stage that the interviewer, KOT, was a medical student who had only worked as a project assistant for half a year. Potential interviewees were contacted by telephone and an appointment subsequently made. When introducing herself to the physician the interviewer specifically pointed out the importance of frank opinions to the success of the evaluation. Two of the most active participants in the project were interviewed first, because we wanted them to give advice on the content of the questions as well as on how they were posed. After the first ten interviews had been conducted and transcribed, KOT and LF met to sum up and discuss preliminary findings. The interviews were screened for leading questions, following up of cues and whether the questions were answered. Except for a few minor adjustments we decided not to make substantial changes to the interview guide, because interviewees did not introduce new themes that were felt to be important new lines of enquiry. Interviews ranged from 13 minutes to 57 minutes duration (mean 31 minutes) and were transcribed in full by KOT.

Sampling. Those of the 73 public health physicians, who were considered likely to provide most information, were interviewed first. These were the physicians who had attended the workshop, submitted questions to the project team and taken an active part in the e-mail

discussion list. As the research progressed, we sampled more selectively to include public health physicians who had been exposed to the intervention to a different degree and at different times. Thirteen of those interviewed had attended a five-day workshop, 17 had attended a three-day workshop, four had attended the one-day workshop and 6 had not attended any workshop at all. Interviews were ceased when there was no longer any substantially new information being found. In total 40 interviews were carried out. Most of those interviewed were in their forties or fifties and five of them were women.

Data analysis. Because important insights may emerge when two different people consider the same set of data (Patton 1987) both LF and KOT classified and coded the data, while AB read through part of the material to get some impression of the data.

We first, separately, read through all of the interviews to get an overall impression and identifying preliminary themes. The material was read several times to identify further categories. We compared and discussed the categories that we had developed with each other and subsequently compared them with the categories in the innovation diffusion model. If we found that the content of a category corresponded to a category from the model, we used the term from the model rather than our own, e.g. ‘previous practice’ was chosen instead of ‘habits’. The material was classified after this classification scheme. The meaning within each of the coded groups was then condensed and abstracted and relevant and representative quotations were selected to illustrate the main points. When in doubt about the content of a quotation, we returned to the context from which quotations had been taken to ensure that the meaning was still consistent.

We took particular care to look for explanatory factors other than those the theory of innovation diffusion presupposes to be important. We also sought for negative cases, e.g.

whether those who had used the information actively differed from the other participants. The data was coded and categorised manually.

Results

How well was the program implemented?

The workshop. The five-day course was arranged on three occasions before it was reduced to a three-day course (box 1) and then towards the end of the project, in order to encourage the participation of the remaining physicians, it was reduced to a one-day course. Fifty physicians out of a total of 73 (68%) physicians in the intervention group received this part of intervention to some degree (1-5 days) (box 2).

Discussion list. 62 (85%) of the 73 physicians were listed as members of the discussion list. During the project period 172 messages were registered, of which 142 messages were sent from the project team. The team messages were announcements of new questions from the participants, announcements of new reports in answer to previous questions, recommendations for interesting on-line articles, messages asking for discussion or response, e.g. whether participants found the service useful. There were two initiatives from the team to teach and stimulate discussions on critical appraisal; one of a systematic review and one of a randomised controlled trial.

17 physicians wrote the 30 messages that did not originate from the team. The messages from the participants were mostly questions, except for four messages responding to the question on how useful the project services were considered. These comments were positive, although the respondents stated that they had not used the services very much.

Database use. Update Software recorded 329 logons to the Cochrane Library, from November 1999 to January 2001 (May to October were missing) (box 2). For the Ovid databases 195 search sessions for the project period were recorded. Average session length was 14 minutes. Not one printout of bibliographic records was noted. The analysis showed a rather low quality of searches made in the databases. Some of the searches were empty, only logons. The majority of the subjects were typical public health themes like radon, home care services and HIV infection.

The strategy to improve the predictable ineffectiveness of the searches was to give search tips on the discussion list, to distribute a quick-card on database interfaces, but first and foremost to remind the participants of our whereabouts and availability.

The information service. The web site had 281 logons during the project period. 21 (29%) of the 73 physicians posed questions to the information service, generating a total of 37 questions. The most active user asked 5 questions (14%). Two project participants who had only received part of the intervention (no workshop) asked two of the questions.

24 (65%) of the questions could be categorised as general public health questions, while 7 (19%) were questions within environmental health and 6 (16%) were related to more individual clinical questions. Examples of questions are shown in box 3.

We managed to answer 16 (43%) of the questions by producing reports based on scientific evidence. Four (11%) questions were forwarded to experts in environmental medicine and for another 11 (30%) of the questions only literature references were provided. Four questions about two topics were put together and answered with two reports. Two of the questions were still at the search stage when the trial ended.

Four reports on the evidence of the effectiveness of using external hip protectors, cardiac and stroke rehabilitation, prevention of childhood injuries and psychiatric

rehabilitation were produced and published on our own initiative, ie, not in response to specific questions. We knew, however, that these were issues of great relevance.

How did the participants experience the intervention?

General project goal. Overall the interviewees seemed to have recognised the intention of the project:

Physician 1-a:

”That this is an initiative from the National Institute of Public Health [...] with two objectives. One is to help get background information of good medical quality for public health decision making, to help us get to know our way around in the world where this information is found. And to support district public health doctors so they don’t feel so alone in their professional frustrations.”

Workshop. Did the physicians feel that the workshop had improved their reflection about and ability to generate and formulate questions, to search for, critically appraise and use research information? The majority did not think that they generated more or different questions. Searching was still a problem and critical appraisal and making summaries of material were still too cumbersome.

They did not, however, blame the course for this. There was an overall positive attitude towards the workshop, which we had also experienced during the evaluation sessions held at the end of each workshop:

Physician 2:

”I just want to say briefly that this was one of the most useful and enjoyable courses I have been on for many years”

Physician 3:

” Yes, I felt it was a very good course, very good.”

On coming home, however, participants felt that a one day course was too short to really learn to search properly. Also, there was no supportive environment in their work

places. They rarely had time to sit down and try it out at once when they returned. When they eventually managed to try it, they found that it was not so easy as they had felt at the course. And of course some did not even get as far as searching at all.

Regarding critical appraisal, five of the interviewees asserted that they were already familiar with these principles and that they learnt nothing new. Most of the others felt that the project, along with previous and parallel education, had contributed to a useful and systematic repetition.

Discussion list. Most of the physicians seemed to have experienced the discussion list as rather peripheral to their daily tasks and some confused it with other discussion lists. Three typical reactions emerged: the issues that were raised were not very relevant to them, at least not at that specific time; there were only a few persons active and finally that participants did not feel very comfortable using electronic tools:

Interviewer: “*What do you think about the discussion list that you had the chance to be on?*”

Physician I-b:

“ Um.. I wasn’t really very involved in it. Partly because there weren’t so many things of interest to me, and then there are... like... a core of three, four or five who carry the discussion very much onto things they are concerned with. And that wasn’t, as I said, very interesting for me. I felt it seemed a bit remote from my everyday situation. And then I don’t know who is on the list, so to then come up with a new question from a different reality; it’s more or less... Well, I don’t know how relevant it is, how interesting it is, because I don’t know who’s on the list. So then I didn’t really throw myself into it very much. Also that you need to enjoy the Internet and I’m not really so into that yet. Then I have to go in all the time and look and there can be a week or two between each time I manage to go into lists like that. So if I start sending a

question, then I have to follow up on it, and I didn't have enough time and interest to do that."

The other information channel and general reminder in the project, the newsletter, was even more distant, i.e. most of the physicians could not even remember it.

Information service. Of the 40 physicians interviewed 17 had posed questions to the information service. Four of the physicians stated that they had actually made use of the answer, as already had been verified in the closed trial for three of them. These physicians had all received full reports. Another explicitly stated that the answer had not been useful, one never received any answer to her question, and the others did not report whether the answer had been useful or not. Anyway, we had not found any documents referring to these reports at the post-test of the previously mentioned intervention.

Ten of the physicians reported that they had connected to the web site several times. Nine of these were the same physicians who also posed questions to the team. The rest of the physicians had not used the web pages, except perhaps a couple of times, for various reasons: They had not felt any need to, time always felt so scarce or they did not have the necessary data skills. Three of them had had technical problems and six had not had the necessary Internet connection at their office desk.

The physicians that had used the web site found the pages easy to use. One of those who had used the site most often commented thus;

Physician 4-a:

" I used it [the web site] several times, because I often followed the publications there. And even if I hadn't asked the questions, I still got a lot of relevant answers to the questions that others had asked. [...] nearly everything that was written there, I sent it round to the relevant professionals with that area of responsibility."

It seemed, however, that most of the physicians had some problems relating the questions presented to their own work, as we also found in relation to the discussion list:

Physician 5:

“ Easy to find your way round, yes, it was very easy to find ... not easy to find something I had any use for, but I could find things easily.”

Those physicians who had used the information service actively by posing questions had a very positive attitude about the whole service:

Physician 4-b:

“ The best thing about the service was really that you could ask public health questions that the Institute dealt with and wrote summary articles about. It was a fantastic service.”

The physicians that had used the service less or not at all, felt that the most useful thing was knowing about its existence:

Physician 6-a:

“[...]... if you ask me: What has been the most useful thing in the project? I would say it is knowing that it is possible, in a easy way, to get hold of evidence-based information when I need it.”

Easy access to research information. It was a common opinion that the project had given better access to research information:

Physician 7:

“Yes, the door has been opened wide so I can't complain about that.”

Why did they not put the innovation into use?

Some of the physicians did not have Internet access, but could have contacted the project team by phone or fax, which two of them actually did. The real reasons for not adopting could therefore not be lack of Internet access, the complexity of searching databases or the critical appraisal of literature. So why did they not put the innovation into use by contacting us?

Felt needs

The most prevalent reason was that they seldom felt that they faced issues in which research information was needed:

Physician 1-c:

” It is amazingly seldom that it (the decision process) is so structured and so important. I think the project leadership should be surprised about that. I am surprised myself. I’ve thought about this during this period. Because it consists ..., this process has so very many other stages, as I just mentioned, that the information bit of it..., you often find it in other sources that you have around you, in books and articles that you’ve noticed, in files or old cases, and asking colleagues. So there are probably many cases where knowledge is important, but not where the evidence bit is so pure and deep and important to carry out [...].”

Physician 8:

“ Well, basically I have been very positive and enthusiastic about the project and the way of thinking. In practice I haven’t felt I have needed it except on odd occasions. [...] I have been surprised myself that there has been such a gap between what I think is ...well, theory and practice, to put it like that.”

The few times that participants felt they had questions where scientific information could have been sought before making decisions, they, for various reasons, still stuck to normal procedure. The main reasons for this were habits or previous practice, time pressure and existing social norms in their own professional environment and the existing norms of other players in the municipalities where they worked. We could not identify what was characteristic of those physicians who had made use of research.

Previous practice

From our previous studies we knew that the physicians usually made use of information sources like laws, reports from central authorities, books, colleagues and experts in their decision-making. Experience and judgement were perceived as important facilitating factors in the decision-making process. So far as research information was used, it was for descriptive epidemiology in relation to an issue. It was perceived as easier to do things the usual way:

Physician 9:

“[...] Well, we take so many decisions as we go along, and it ... sometimes it doesn't seem necessary to use research-based information. It is like as if I know I should do it but it's easier not to. And so we do it the way we always have done. It's something to do with the way understanding doesn't always lead to changed practice, to put it like that.”

Time pressure

One might consider that our offer to search for and evaluate information for participants would have made research information so much more accessible that it would have been possible, in terms of time, to ask for it. It appears, however, that anything which comes in addition to the existing, is one thing too many:

Physician 10:

“Purely timewise, I have to say that the time it should take to do things sensibly and in a more or less well-founded way, well, I just don’t have it”.

Physician 11:

“... Well, the threshold is lower, that I am convinced of, but it’s still not low enough so that when I’m going to write something and think I can use 15-20 minutes on it, well, I don’t get anything evidenced-based out of it.”

Norms of the social system

The physicians are part of a community culture where evidence-based working does not represent the normal procedure when reaching decisions about suggested initiatives:

Physician 6-b:

“ I have rarely experienced anyone asking any questions about how I came by the information which I serve as ‘knowledge’ or what the scientific basis is for the recommendations I make”

In the physicians’ opinion, even if finding and using scientific information had the advantage of making them more confident, it would not be important to or make any difference to the other groups involved in decision-making processes:

Physician 12:

“[...] The disadvantage is that I have to keep to it (research-based information). It is an advantage, too, in a way because then I have a basis to stand on. The disadvantage is that the politicians don’t always want evidence-based medicine. Because they want to make decisions from a completely different rationale than I do – a political rationale. And that, unfortunately, has nothing to do with evidence. It can have to do

with evidence, but they add in feelings, human reactions, economy and other things to their decision-making.”

Physician 1-d:

“Other players, you know, they are like most people. They have their views and don’t let themselves be moved by facts, whether they are political views or medical views. So the reaction is everything from... well, if I whallop them over the head with a Cochrane report, they whallop me over the head with an article from ‘Woman and Clothes’. And think that makes us equal. To put it simply.”

Somehow it seemed as if the public health physicians did not consider it their task to supply their community with objective and explicit premises for decision-making. Their way of working itself bears a resemblance to the way politicians work. For various reasons they decide on what solution to promote and their focus is perhaps more on which strategies to select to get it accepted, rather than making explicit how they themselves reached their conclusion:

Physician 6-b:

“[...] ...when there is something I am enthused about and that I would like to get through, then I have to think strategy really. You become a political figure in the district authority even if you are, of course, very aware of your role. I’m not supposed to be a politician, I am supposed to provide professional knowledge to the local authority. Somehow, - when you feel something is professionally correct and good you want to put it forward so that it goes through. And then you have to find the arguments that will sell it best, without prostituting yourself or compromising the subject. It is for the sake of the subject that you want it to go through.

Discussion

To what degree was the intervention implemented?

We examined the quantitative process data to document to what extent the intervention program was delivered as planned. Formally, the intervention was implemented fully in that we arranged workshops, established a discussion list, and ran the information service and so on. However, it must be called a weak implementation: The duration of the workshop had to be reduced, which meant a lower dosage of the intervention. The discussion list did not function as an online peer network thus reducing its importance in the persuasion stage. This was surprising since so many physicians in the prestudy had been keen on professional networking. Presumably the list had too few members to reach the critical mass needed to sustain ongoing discussion (Mavis and Brocato 1998; Worth and Patrick 1997). It was also a drawback that the web site was built during the course of the project and therefore did not contain much information at the beginning.

It is worth noting that 21 of 73 people sent us 37 questions, representing an uptake of the information service of 29%, more or less the same level as was found in two studies from primary care (Hayward et al. 1999; Swinglehurst et al. 2001). The 21 had recognised an information need and generated a question, despite disincentives such as habit and local culture. However, we found that the replies from the information service were used in practice by only three of them. Why did this happen? Presumably, the reason for this lies partly in the answers we were able to provide (not everyone received a full report in answer to their question) and partly in the characteristics of the individual as according to diffusion theory. It was only possible to answer 16 of the 37 questions adequately, illustrating how difficult it is to provide satisfactory answers to many public health questions. Still, in their documents (that were collected and analysed in the trial) the physicians could have referred to the futile search for evidence.

The intervention was successful in the sense that we managed to make participants understand the purpose and they did feel that research had been made more easily available to them. Since our previous studies the physicians had clearly increased their knowledge about evidence-based health care in many respects, and this was also supported by the findings of the former trial. However, on some occasions during the interviews we wondered whether we had managed to impart any deeper understanding of the principles of evidence-based health care, e.g. that it is not the intention for decisions to be made on evidence alone.

Exploring the physicians' experiences of the intervention to understand the outcome of the trial

We used innovation diffusion theory to consider factors related to the innovation on the assumption that this would help us elucidate why the innovation did not diffuse. We found that the physicians' felt needs, and the norms in their social environment for how decisions are made combined with existing practice patterns were explaining factors.

Searching and critically appraising were seen as too complex and therefore incompatible with everyday work, although sending questions to an information service and receiving ready-made digests of research was, in principle, seen as a possible way to work. The information service, as it was offered, represented a simplified version of the innovation evidence-based methodology. The fact that the physicians saw the service as comparatively compatible and simple, besides being observable and triable, was apparently not enough to outweigh the unfavourable prior factors. It may be maintained that in our conceptual model of the intervention we put too much weight on individual factors and too few on organisational ones. Support from management and the existence of local champions for change are important variables in organisational innovation literature (Ruppel and Howard 1998). The program's aim to change physicians' perceptions of need by targeting their knowledge and

attitudes and at the same time filling the role of ‘champion’ for the use of scientific information did not compensate for lacks in their local organisational culture. Of the original barriers found in the pre-study (Forsetlund and Bjørndal 2002); psychological, environmental and information source characteristics, we managed to change only information source, by providing easier access to research information physically, intellectually and functionally.

No matter how the means to search for evidence are made reasonably available, the time factor still seems to be a problem. Even with access to an information service one still has to take time to formulate questions and interact with the service team. Sacket and Straus in their study of using an ‘evidence cart’ found that hospital clinicians rarely searched for evidence if it was not readily available, virtually within seconds. This indicates that time is a major issue across the medical professions (Sackett and Straus 1998). Or is time only used as an argument for something you are not required to do? Public health physicians do in fact collect a lot of epidemiological data, in areas and on topics where it is ‘traditionally’ considered necessary and where it has been taught in the medical curriculum for years.

Strengths and weaknesses of the study

Although the approach of using someone outside the project to do the interviews on the whole seemed to be successful, it also lead to questions not being followed up in more detail in some instances, representing a potential loss of more detailed, in-depth responses. Moreover, using a relatively inexperienced interviewer may not have been totally successful in drawing out issues which participants were reticent to talk about. Interviewing by telephone may also have sent other signals to the physicians concerning the importance of the evaluation, than if we had taken the trouble to travel all over Norway to talk to them at their work site. An improvement to our methodology could for instance have been to use two interviewers and/or interviewing each one face-to-face.

Our findings emerged through consensus between the analysers. Recognising patterns independently, especially as we had different experiences and professional backgrounds, strengthens the validity of our findings, although care should be taken when using consensus between analysers for validity strengthening purposes (Malterud 1996). Further, the monitoring data and the outcomes of the previous randomised-controlled trial confirm the physicians' own accounts of sparse use. This supports the validity of the findings in this study. However, the fact that all the authors work in an environment that views evidence-based practice as important may have influenced what we chose to emphasise. Several physicians had the opinion that we were inclined to overestimate the number of cases in which scientific evidence was relevant.

Using innovation diffusion theory gave a meaningful framework to the interpretation of our data. However, we accept that starting out with an explicitly predefined theory may have blinded us to other themes or explaining variables in the material. In contrast to this, our findings support the theory that habits, perceived needs and norms of the social system constitute important prior conditions for innovation diffusion.

Implications

It has been suggested that to promote evidence-based practice one can improve access to summaries of evidence (McColl et al. 1998) and establish information services that can help practitioners access these summaries (Greenhalgh et al. 2002). However, in our study as in previous studies, these services only appear to be used by a minority. Although all of the users expressed satisfaction with the service, few made explicit use of the evidence. Even those who never used the services expressed satisfaction with their existence. Our study demonstrates that in spite of users' declared satisfaction, providing an information service to a target group does not necessarily lead to increased use of scientific evidence in practice, even

when combined with educational and communicative support. Therefore, satisfaction is a poor indicator of practical use, even though it is often used as such (Hayward et al. 1999; Swinglehurst et al. 2001; Anderson et al. 1999; Brassey et al. 2001; Del Mar et al. 2001).

In Norway, tasks within general public health are often about providing background information and advice for local health decisions, decisions which are then taken in a political setting. The reasons the physicians in this study gave for not referring to research in policy documents express the existing norms of their social system, as well as their own norms. These reasons are almost identical to the reasons summed up by Black in his editorial “Evidence-based policy: proceed with care” as to why research evidence has little influence on service policies (Black 2001). Interestingly, the physicians themselves seem to work in the same way as policy-makers and take the similar issues into consideration in their decision-making. The analysis of interview data indicated a strong resemblance to how Weiss found that policy-makers seek out and use research information. Like the policymakers the physicians did “...relatively little search for evidence or analysis. People tend to make do with what they already know – or at least know about...” (Weiss 1986, p. 276). They first and foremost used the web site for passive information searching or as Weiss would have put it, for “enlightenment”: They logged in to check whether there was anything new rather than because they had identified specific information needs.

There has been some scepticism about the promotion of evidence-based policy simply as an extension of evidence-based medicine, ie, that policymaking is qualitatively different. In the editorial by Black this scepticism is based among other things on Weiss’ enlightenment model and Lomas’ framework for understanding policymaking (Lomas 2000). Our data from this study as well as our prestudies support Weiss’ enlightenment model. Even so, in our opinion, this does not mean that it is not desirable for knowledge gaps to be identified through reflective practice or that research cannot be used to fill that gap when possible. Even if

policymakers have to disregard research results when taking into account the full complexity of a situation, the basis on which the final decision is made should be made explicit. Those who provide background information should attach importance to supplying decision-makers with all possible types of relevant information.

The question is rather how can we promote evidence-based practice when conscious and planned searching for research is so difficult to attain. We support the view of Guyatt et al. (Guyatt et al. 2000) that not every practitioner is likely to become skilled in searching for and in appraising evidence. Therefore it is even more important to develop systems that ensure the use of reliable research (Ghali 2002). Both the perspectives of passive information seeking representing the enlightenment model and active information searching representing an instrumental model should be maintained. We know that public health physicians in Norway make frequent use of documents from central authorities. These documents are supplied through well-established information channels, thus coming “naturally” or passively without much effort. Making these documents evidence-based would in itself constitute a great leap forward towards evidence-based health care at the local level, while providing information services would pay heed to the instrumental perspective. Integrating evidence-based methodology into medical education at all levels is another measure, which still does not seem to have been properly implemented (Ghali et al. 1998; Green 1999).

We would like to emphasise that though the setting and organisation of public health in Norway is quite specific, the fact that the results are consistent with others’ findings, indicates that our result may be transferable to other countries and different health care professions.

Conclusion

Through this study, we wanted to gain more insight into the observed outcome in our randomised-controlled trial. Had a valid experiment been carried out and if so, which factors

could explain the lack of diffusion? We found that the outcome was caused by the program itself and not by an insufficient implementation. An important finding was that user satisfaction is a poor indicator of the practical usage of evidence. The program did not change one of the most important prior conditions for the diffusion process: the perceived needs of the physicians, and it could not compensate for the existing norms of their social system. Documents from local and central authorities are already frequently used as information sources in public health decision-making and these could be used as the main information channel in the diffusion process, if they were explicitly based on research evidence whenever possible. This would shift the focus from the individual potential user to a more organisational level. In addition, a continuing information service should be made directly available to public health physicians to answer those questions that do arise and the teaching of evidence-based health care should be an integral part in all types of medical education.

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Table 1a. Differences between groups for using research to some extent (tested by means of Mann-Whitney)

<i>Behaviour</i>	Intervention			Control			P
	Number of respondents	Mean score	(SD)	Number of respondents	Mean score	(SD)	
Hypothetical assignment	(50)	2.1	(1.3)	(48)	1.8	(1.2)	0.154
Additional questions	(46)	2.2	(1.4)	(43)	1.7	(1.0)	0.063

Table 1b. Differences between groups for using research to some extent

<i>Behaviour</i>	Intervention (N=73)			Control N=75)		
	(N) (= number of respondents)	n (= number using research to some degree)	(% of total=73)	(N) (= number of respondents) to some degree)	n (=number using research)	(% of total=75)
Reports	(17)	0	(0)	(25)	1	(1)
<u>Postal survey:</u>						
Advice-giving documents	(52)	3	(4)	(58)	0	(0)
<u>Telephone survey:</u>						
Giving information on hip protectors to nursing homes	(73)	2	(3)	(75)	0	(0)

Table 2. Student t test of differences between groups for intermediate variables at post-test

	Intervention (N=58)	Control (N=61 unless otherwise stated)					
	Mean (SD)	Mean (SD)	Mean diff	95% CI	t	DF	P
Source knowledge	1.1 (0.6)	0.7 (0.5)	0.4	0.2-0.6	4.3	111.5	0.00
Concept knowledge	1.3 (0.4)	1.1 (0.4)	0.2	0.0-0.3	2.6	115.3	0.01
Attitudes	5.4 (0.8)	5.2 (0.7)	0.1	-0.2-0.4	0.9	115	0.37
Decision-to-adopt (n=56)	4.9 (1.2)	5.1 (0.9)	-0.2	-0.6-0.2	-0.9	97.8	0.35
Self-efficacy	4.0 (0.9)	3.9 (0.9)	0.1	-0.2-0.4	0.5	116.9	0.60
Job-satisfaction	4.3 (1.3)	4.0 (1.2)	0.3	-0.1-0.8	1.5	114.6	0.13

Knowledge of sources: Mean of additive score of 0='unknown', 1='known, but not used', 2='read', 3='used in a public health decision-making situation'

Knowledge of concepts: Mean of additive score of 0='unknown', 1='known', 2='so known that I can explain to others' + an extra point (1) if correctly answering "Method chapter" as to what is the most important chapter for deciding scientific quality of an article

Attitudes: Likert scale: 1='totally disagree', 2='disagree', 3='partly disagree', 4='neither agree nor disagree', 5='partly agree', 6='agree', 7= 'totally disagree'

Decision-to-adopt: Likert scale: 1='totally incorrect', 2='incorrect', 3='Somewhat incorrect', 4='neither right nor wrong', 5='somewhat correct', 6='correct', 7='totally correct'

Job-satisfaction: Same Likert scale as attitudes